

CRYPTO PORTFOLIO TRACKER AND ALERT APPLICATION

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ABSTRACT

The objective of the paper is to build a platform for cryptocurrency investors, who purchase cryptocurrencies on different cryptocurrency exchange platforms where the investor can create his portfolio on the platform and track the real-time profit/loss of his total portfolio balance as well as in each cryptocurrency he has invested in and can also set reminders. With this platform, he can also link his WhatsApp to get notification alerts of his portfolio balance and profit/loss in real-time. This real-time notification alert feature is implemented with Django Celery and Redis. Celery is a task queue with a focus on real-time processing, which also supports task scheduling. Redis is a message broker.

Keywords: Cryptocurrency, Portfolio, Cryptocurrency exchange platform, Celery, Redis, real-time processing, Task scheduling, Message broker.

I. INTRODUCTION

For any crypto investor, it is important to be able to easily keep track of the performance of his assets and it is also important that the investor maintains a portfolio that is consistently well-balanced and well-diversified, which are two key practices for keeping the investor's wealth in good health. As the investor adds assets to his portfolio, especially those of the fast-changing variety, the more time he needs to spend time tracking all of them. This is where the application comes in handy for all the crypto investors, the application helps the investor enabling him to easily monitor the performance of the cryptocurrencies and other assets, he has invested in, all in a single view. The most important thing that any investor need is to get notified about his portfolio value at the right time, so he doesn't lose the money he has invested in when there is a price drop.

Any investor can purchase cryptocurrency from popular crypto exchanges. There are many ways to buy cryptocurrency safely, though the easiest method for beginners is likely to be a centralized

exchange. Centralized exchanges act as a third-party overseeing transactions to give customers confidence that they are getting what they pay for. There are thousands of different cryptocurrencies, And, just like fiat currency, the value of each is always changing. The difference between the stock market and crypto market is that cryptocurrency markets trade 24/7/365

Fang et al[1] in their paper defines cryptocurrency trading and categorizes it into cryptocurrency markets and cryptocurrency trading models. They have discussed the analysis of the research distribution, datasets, and trends that characterize cryptocurrency trading.

The paper also provides a detailed description of the Blockchain as the enabling technology, cryptocurrency markets, the advantages and disadvantages of trading cryptocurrency, and the cryptocurrency trading software system. Figure. 1 shows the workflow of a single blockchain transaction which describes how a single transaction request is made, validated, and then added to the existing blockchain.

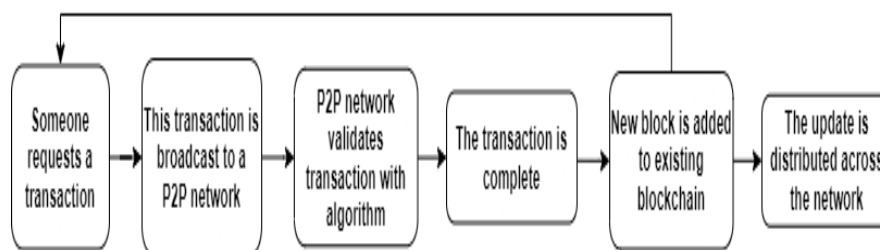


Figure 1. Workflow Of Blockchain Transaction

The article ‘Why you should invest in blockchain?’ [2] discusses the People’s perspectives on investment in blockchain technology, various applications of blockchain, other ways to invest in blockchain, and various industries where blockchain is implemented. The advantages and disadvantages of investing in cryptocurrencies are discussed by Jim Cunha and Colm Murphy [3]

The application helps investors to set reminders where he gets a notification alert about their portfolio based on the portfolio limit set by them. These notification alerts are sent to his email as well as to the user’s WhatsApp. Since the crypto market is volatile it is important for investors to place sell orders based on the market situation.

II. SYSTEM ARCHITECTURE

The first step is to create the front end. Following the creation of sections, each section will be

subjected to tables or items management. The middleware is the next phase, which works as a server and keeps user information in a database. If there are any mistakes in the data, it tests the functionality and displays an error to the user. In this Coingecko API is used for processing the data. Django and Redis are used to accomplish this. The final step is to enter the information into the database. The information is stored in SQLite3. HTML, SQLite3, Django, Redis, Coingecko, Twilio, and Celery for state management are the technologies utilized to build this project. The middle (application) tier is made up of Django and Coingecko. Django is a popular and capable python server platform, while Celery and Redis is a server-side web framework. Celery is the best way to work with JavaScript and JSON from start to finish with scheduled tasks, regardless of whatever form you choose. The design makes it simple to build a three-tier architecture (frontend, backend, and database) using only JavaScript and JSON.

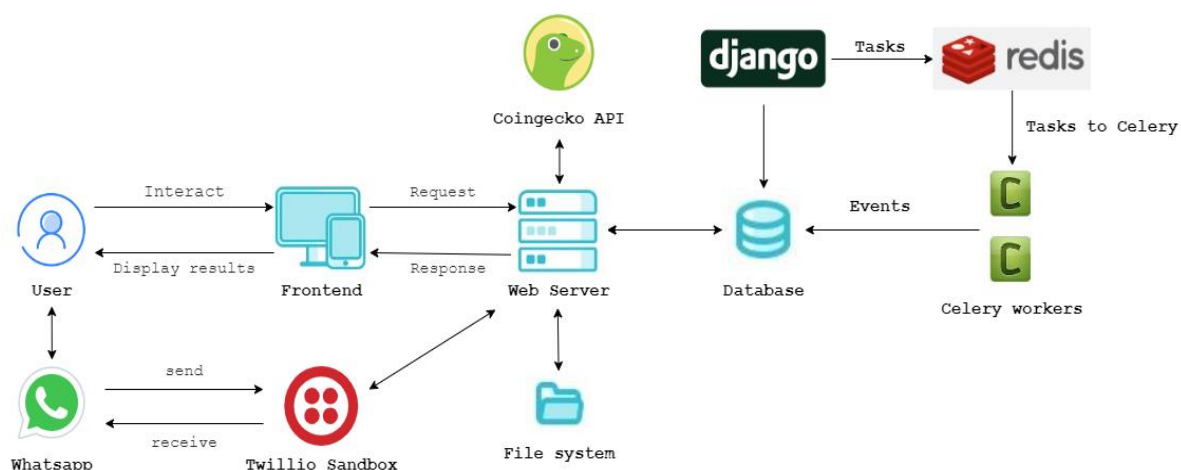


Figure 2. System Architecture

1. Html CSS Bootstrap Front End

HTML is a declarative Hypertext Markup Language for documents designed to be displayed in a web browser. HTML allows you to create complex interfaces by connecting simple attributes to data on your backend server and rendering them as HTML. HTML excels at handling stateful, data-driven interfaces with minimal code and suffering, and it comes with all the bells and whistles you'd expect from a modern web framework, including excellent support for forms, error handling, events, and lists, among other features.

2. Coingecko and Django Server Tier

The Coingecko API, which runs inside a Django server, is the next step down. Coingecko describes itself as a "quick, unopinionated, minimalist web API for Django" [4]. For URL routing (matching an incoming URL with a server function) and handling HTTP requests and answers, Coingecko includes strong models. To access and change data in your SQLite3 database, those functions leverage SQLite3's Django drivers, either via callbacks or promises.

3. SQLite Database Tier

If your app saves any data (user profiles, content, comments, uploads, events, and so on), you'll need a

database that's as simple to use as HTML, Coingecko, and Django. JSON documents written in your HTML end can be transmitted to the Express.js server, where they can be processed and (if they're valid) stored straight in SQLite for subsequent retrieval.

4. Special Tools

The application uses Redis and Celery to Schedule the reminders and sends it to WhatsApp via twilio sandbox[5,6]. The Redis and Celery can be rescheduled as per the user.

III. METHODOLOGY

Initially, the user has to log in if he is an existing user else the user needs to sign up. Then if the user is new, he needs to add all the transactions which he has made on different platforms to create his portfolio and set reminders to get alerts of his total portfolio balance. If the user is an existing user, he can add the latest transactions that he has not added to the portfolio, or he can set new reminders. After creating a portfolio or editing the current portfolio user can view real-time statistics of his portfolio which include real-time profit/loss in each coin and holdings of each coin

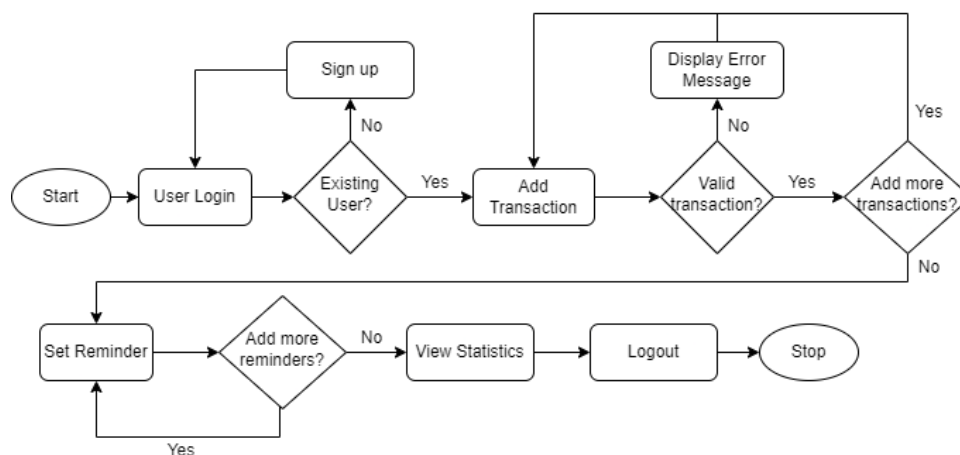


Figure 3. Flow Chart for Creating Portfolio and Adding Reminders

IV. RESULTS AND DISCUSSION

The various steps involved in the process of developing this app are discussed and the outcomes are discussed below.

Step-1: Login/Signup

If the user is not an existing user, then he needs to sign up by filling in required details like username, E-mail, and password.

Figure 4. Sign up Page

If the user is an existing user, then he needs to login with his username and password.

Figure 5. Login Page

Step-2: Adding Transactions

Add all the transaction details of all your holdings on different platforms

Figure 6. Add Transaction Form

Step-3: Setting Reminders

You can set a reminder by providing the details of at what price it should send a notification alert and should also mention above/below the mentioned price.

Rank	Symbol	Coin Name	Quantity	Price	Market Cap	Change
7		Cardano				
8		Solana				
10		Dogecoin	100	681.00	6.81	₹ -143.00
44		Apocoin	0.1	45.73	457.33	₹ -23.77

Figure 7. Add Reminder Form

The application shows rank, name, price, holdings, market cap, change in currency value over 1hour,24hours,7days, total portfolio balance, and profit/loss in real-time.

Holdings

Rank	Symbol	Coin Name	Quantity	Holdings	Price	P/L	1h	24h	7d
7		Cardano	10	432.50	43.25	₹-84.50	2.51%	-16.19%	-26.82%
8		Solana	1	4003.36	4003.36	₹-1252.98	1.68%	-25.90%	-39.04%
10		Dogecoin	100	681.00	6.81	₹-143.00	2.11%	-21.38%	-31.45%
44		Apecoin	0.1	45.73	457.33	₹-23.77	2.78%	-36.24%	-57.75%

Statistics



Figure 8. Holdings Table and Statistics

Also when the portfolio balance of the user hits the price limit mentioned, then the notification alert is sent to the user's email and to his WhatsApp number.

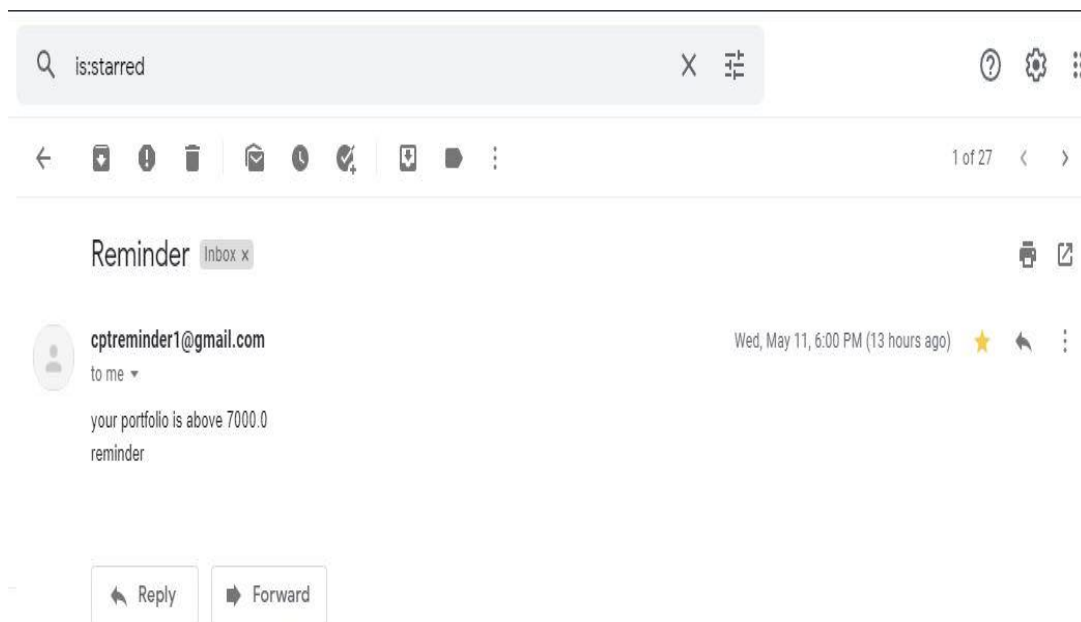


Figure 9. E-mail Notification Alert



Figure 10. WhatsApp Reminder Notification

V. CONCLUSION

From the results, we conclude that the real-time notification alert helps investors by taking decisions immediately and placing sell orders so that they don't miss out on their profits or not have major losses. The statistics of each coin provided also helps the investor better understand his portfolio.

As of now, the application is only useful for cryptocurrency investors but in further enhancement, stocks can be included as well, where any type of trader can use this platform to analyze his portfolio. The platform then becomes helpful to not only crypto investors but to the ones who invest in stock as well as who invest in both stocks as well as crypto.

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